

Rules of Ichnographic R.C. Structure Construction and Detail

Drawing

(Independent Foundation, Strip Foundation and Pile Foundation Bearing Platform)

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Contents

General Specification	1
Chapter 1 General Provisions	3
Chapter 2 Drawing Rules of Independent Foundation	5
Section 1 General Requirements for Ich-CD of Independent Foundation	5
Section 2 Independent Foundation Number	5
Section 3 Notations for Plane of Independent Foundation	6
Section 4 Notations for Section of Independent Foundation	23
Section 5 Others	24
Chapter 3 Drawing Rules of Strip Foundation	24
Section 1 General Requirements for Ich-CD of Strip Foundation	24
Section 2 Strip Foundation Number	25
Section 3 Notations for Plane of Foundation Beam	25
Section 4 Notations for Plane of Strip Foundation Slab	29
Section 5 Notations for Section of Strip Foundation	33
Section 6 Others	34
Chapter 4 Drawing Rules of Pile Foundation Bearing Platform	34
Section 1 General Requirements for Ich-CD of Pile Foundation Bearing Platform	34
Section 2 Pile Foundation Bearing Platform Number	35
Section 3 Notations for Plane of Independent Bearing Platform	35
Section 4 Notations for Plane of Apron Piece	40
Section 5 Notations for Section of Pile Foundation Bearing Platform	41
Section 6 Others	42
Chapter 5 Drawing Rules of Foundation Connecting Beam and Underground Frame Beam	42
Section 1 Expression Methods of Foundation Connecting Beam	42
Section 2 Expression Methods of Underground Frame Beam	43
Section 3 Others	44

General Specification

1. This concrete structure drawing collection is one of the G101 series of the National Building Standard Design (hereafter as NSD) Drawing Collection using ichnographic construction drawings (hereafter as "Ich-CD").

2. G 101 series of "Rules of Ichnographic R.C. Structure Construction and Detail Drawing" cover the following atlas:

03G101-1 (Cast-in-situ concrete frame, shear wall, frame-shear wall, frame-supported shear wall structure);

03G101-2 (Cast-in-situ concrete slab stairs);

04G101-3 (Raft foundation);

04G101-4 (Cast-in-situ concrete floor plate and roof sheathing);

06G101-6 ((Independent foundation, strip foundation and pile foundation bearing platform).

3. This drawing collection is applicable to design and construction for independent foundation, strip foundation and pile foundation bearing platform of reinforced concrete. The structure above the foundation may be cast-in-situ concrete frame, shear wall, frame-shear wall, frame-supported shear wall and bent structure, steel structure, mixed structure and masonry structure in non-seismic area and in the area with seismic fortification intensity 6~9.

4. This drawing collection covers drawing rules and standard construction details for independent foundation, strip foundation and pile foundation bearing platform of cast-in-situ concrete, and for foundation connecting beam and underground frame beam related to such three foundations. This drawing collection excludes irregular independent foundation in special shape.

5. Drawing rules of this drawing collection are not only the criteria for the designer to prepare but also the ones for construction, supervision, etc. personnel to accurately understand and implement the Ich-CD of independent foundation, strip foundation and pile foundation bearing platform of cast-in-situ concrete.

6. The standard construction details of this drawing collection have been incorporated into the presently common and relatively mature construction practice in China, and are formal design documents that must be used together with Ich-CD by design, construction, supervision, etc. personnel.

7. Design criteria of standard construction details of this drawing collection:

(1) "Code for Design of Concrete Structures" GB 50010-2002;

(2) "Code for Design of Building Foundation" GB 50007-2002;

(3) "Code for Design of Steel Structures" GB 50017-2003;

(4) "Code for Design of Masonry Structures" GB 50003-2001;

(5) "Code for Seismic Design of Buildings" GB 50011-2001;

(6) "Standard for Structural Drawings" GB/T 50105-2001.

8. Construction details not included in drawing rules and standard construction details of this drawing collection and other unfinished matters shall be designed separately by the designer in specific engineering. "Modification Form for Standard Construction Details" provided in this drawing collection aims to provide reference for the designer in specific

engineering design when there is need to make some change for standard construction details of this drawing collection and to clearly write the change content in the general specification of structure design.

9. Unless otherwise noted, the dimension unit in this drawing collection is millimetre and the elevation one is meter.

10. Please log in the following website of China Institute of Building Standard Design & Research for proposing problem or advice in use of this drawing collection, <http://www.chinabuilding.com.cn>.

Chapter 1 General Provisions

Article 1.0.1 This drawing rule is formulated with a view to standardizing the application of Ich-CD for building structure construction drawing, guaranteeing unified structure construction drawing drawn based on Ich-CD and ensuring the quality of design and construction.

Article 1.0.2 The drawing rules of this drawing collection are applicable to construction drawing design for concrete independent foundation, strip foundation, pile foundation bearing platform as well as foundation connecting beam and underground frame beam.

Article 1.0.3 Where adopting the drawing rules, it shall not only comply with this drawing collection, but also the current relevant standards, codes and specifications of the nation.

Article 1.0.4 Foundation structure construction drawing drawn based on Ich-CD shall directly express plan position, dimension and reinforcement of various foundation members in foundation layout plan according to Ich-CD drawing rules of various foundation members. For complex industrial and civil buildings, plan or necessary details for formwork, foundation pit, reserved hole, embedded parts, etc. shall be added if necessary.

Article 1.0.5 Express dimension and reinforcement of independent foundation, strip foundation, pile foundation bearing platform, foundation connecting beam and underground frame beam in layout plan, adopting the notations for plane and supplemented by notations for section.

Article 1.0.6 Construction drawings, drawn based on Ich-CD, of independent foundation, strip foundation, pile foundation bearing platform, foundation connecting beam and underground frame beam shall number all the foundation members according to the drawing rules of this drawing collection; the number contains type code and its main function is to designate the selected standard construction details; code has been noted in the standard construction details according to member type so as to define complementary relation of same members in details and Ich-CD, and thereby combining the two to constitute complete foundation construction drawing design.

Article 1.0.7 Construction drawings, drawn based on Ich-CD, of independent foundation, strip foundation and pile foundation bearing platform shall adopt table or other mode to note the datum elevation and ± 0.000 absolute elevation of foundation bottom.

This drawing collection shall be used in conjunction with national building standard design 03G101-1 and 04G101-3; in the identical single project, the determination for floor (ground) elevation of structural layers, height of structural layers and datum elevation of foundation bottom must be unified, so as to guarantee such members as subgrade and foundation, column and wall, beam, slab and stair are marked according to unified vertical orientation relation. For the convenience of construction, the unified floor (ground) elevation of structural layers, height of structural layers and datum elevation of foundation bottom shall be respectively noted in Ich-CD of various members such as foundation, column, wall and beam.

Notes: 1. The bottom elevation of independent foundation and strip foundation is the top elevation of foundation bed

(including waterproof layer) covering subgrade; the bottom elevation of pile foundation bearing platform is the top elevation of cushion layer (including waterproof layer) covering upper surface of soil between piles.

2. Where the bottom elevation of all foundations in specific engineering is same, the datum elevation of foundation bottom is the foundation bottom elevation; where the foundation bottom elevation is different, the majority of same bottom elevation shall be taken as the datum elevation of foundation bottom; for other minority of different elevations, the relative positive-negative dimension with datum elevation shall be noted according to specific rules.

3. Floor (ground) elevation of structural layers refers to the elevation value of floor (ground) elevation of each layer deducting practice thickness of building surface layer and cushion layer in architectural drawing. For the convenience of construction, the number of structural layers shall be corresponding and consistent with that of building storeys; under special circumstances, the structural layers without corresponding building storey number may be added. E.g. when underground frame beam which is buried in soil is arranged through general method, it may be regarded as one structural layer, and then the top elevation of underground frame beam is the floor (ground) elevation of structural layer.

Article 1.0.8 To facilitate the design expression and construction drawing recognition, the coordinate directions of structural plane are specified as follows:

1. Where two-direction axis grids are in orthogonal layout, the drawing shall be X direction from left to right and Y direction from down to up; where axis grid rotates in some position, the rotation angle of local coordinate direction along the axis grid shall make corresponding rotation, and the coordinates after rotation shall be diagramed.

2. Where the axis grid is arranged centripetally, the tangential direction shall be X direction and the radial direction shall be Y direction, and they shall be diagramed.

3. For the area with relatively complex plane layout, such as turning and bordering area of axis grid and core zone with centripetal arrangement, the plane coordinate direction shall be specified separately by the designer and diagramed.

Article 1.0.9 In order to ensure the construction personnel execute exactly in accordance with Ich-CD, the general specification for the structure design in specific engineering must add the following contents closely related to Ich-CD:

1. The drawing collection No. (e.g. this drawing collection No. is 06G101-6) of the selected standard Ich-CD shall be noted in order to avoid adopting wrong edition during construction after the drawing collection is updated.

2. Concrete strength grade and steel bar grade of independent foundation, strip foundation and pile foundation bearing platform adopting Ich-CD shall be noted in order to determine the minimum anchorage length and the minimum overlapping length, etc. of the relevant tensile steel bar.

3. Where post-pouring strip is arranged, position and pouring time of post-pouring strip as well as specific requirements for strength grade, mix proportion, etc. of post-poured concrete shall be noted.

4. Environment category of members shall be noted; e.g. the condition that the environment category is "II-a" or "II-b" and there are specific requirements for concrete cover thickness of foundation members shall be described.

5. Specific changed contents shall be noted where partial change needs to be made for the standard construction details of this drawing collection in specific engineering.

6. Where the specific engineering adopting Ich-CD has special construction uncovered in this drawing collection, it shall be supplemented in the construction drawing.

Article 1.0.10 The concrete cover thickness and the overlapping and anchorage length

of stressed steel bars shall comply with the relevant construction requirements in standard construction details of this drawing collection, unless otherwise noted in the structure construction drawing.

Chapter 2 Drawing Rules of Independent Foundation

Section 1 General Requirements for Ich-CD of Independent Foundation

Article 2.1.1 Ich-CD of independent foundation covers notations for plane and notations for section; the designer may select one according to the conditions of specific engineering or their combination for construction drawing design of independent foundation.

Article 2.1.2 Where layout plan of independent foundation is drawn, the planes of independent foundation and the column supported by foundation shall be drawn together. Where foundation connecting beam is arranged, foundation connecting beam and foundation layout plan may be drawn together according to the density condition of the drawing, or the layout drawing of foundation connecting beam may be drawn individually.

Article 2.1.3 Location dimension of foundation shall be marked in layout plan of independent foundation; where the center line of column or the center line of cup of independent foundation does not coincide with building axis, the eccentric dimension shall be marked. For the foundation with same number and location dimension, only one may be marked.

Section 2 Independent Foundation Number

Article 2.2.1 Various independent foundations shall be numbered according to those specified in Table 2.2.1.

Table 2.2.1 Independent Foundation Number

Type	Section form of foundation slab	Code	No.	Description
Ordinary independent foundation	Step form	DJ _J	xx	1. Single step section is slab independent foundation. 2. Foundation slab with slope form section may be four-slope, three-slope, double-slope and single-slop.
	Slope form	DJ _P	xx	
Cup independent foundation	Step form	BJ _J	xx	
	Slope form	BJ _P	xx	

Attention shall be drawn during design, where the section form of independent foundation is slope form, the slope surface shall adopt relatively gentle gradient which is capable of guaranteeing concrete pouring and compacted by vibrating; where steeper gradient is adopted, such measures as adding formwork at top slope surface of foundation shall be taken in construction, so as to ensure slope surface of independent foundation formed by pouring and compacted by vibrating.

Section 3 Notations for Plane of Independent Foundation

Article 2.3.1 Notations for plane of independent foundation are divided into concentrated marking and original place marking.

Article 2.3.2 Concentrated marking for ordinary independent foundation and cup independent foundation refers to concentrated citation in foundation plan; foundation number, section's vertical dimension and reinforcement must be marked; where the elevation of foundation bottom and the datum elevation of foundation bottom are different, relative elevation difference and necessary text note may be optional.

Except no foundation reinforcement, for concentrated marking of ordinary independent foundation of plain concrete, the type and content shall be the same as those of ordinary independent foundation of reinforced concrete.

Specific content of concentrated marking of independent foundation is specified as follows:

1. Note independent foundation number (mandatory), see Table 2.2.1.

Section form of independent foundation slab generally covers:

- (1) Step form section, number plus subscript "J", such as DJ_Jxx, BJ_Jxx;
- (2) Slope form section, number plus subscript "P", such as DJ_Pxx, BJ_Pxx.

2. Note vertical dimension of independent foundation section (mandatory). The following is the description by ordinary independent foundation and cup independent foundation respectively.

- (1) Ordinary independent foundation:

Note $h_1/h_2/\dots$, with specific marking as:

- 1) Where the foundation is step form section, see Figure 2.3.2-1;

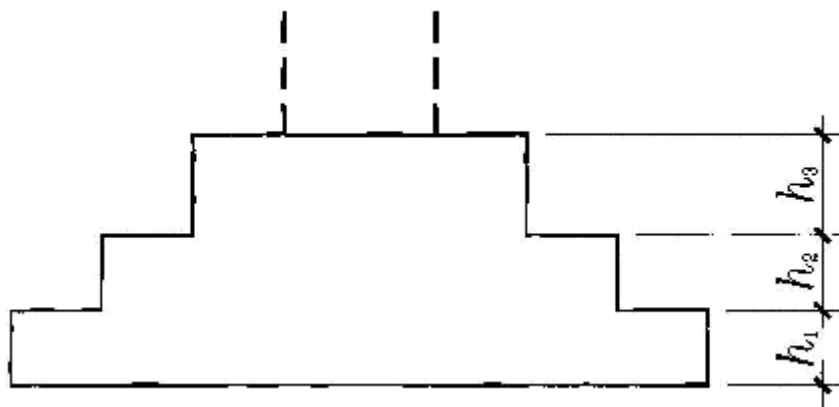


Figure 2.3.2-1 Vertical Dimension of Ordinary Independent Foundation with Step Form Section

For example: where the vertical dimension of ordinary independent foundation DJJxx with step form section is noted as 300/300/400, it means $h_1=300$, $h_2=300$, $h_3=400$, and the total thickness of foundation slab is 1000.

The above example and Figure 2.3.2-1 are three-step; if more, the dimension of each step, from bottom to top, shall be separated by "/" and written in turn.

Where the foundation is single-step, the vertical dimension is only one and is the total

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